

# Self-Deploying Tent Array, Phase I

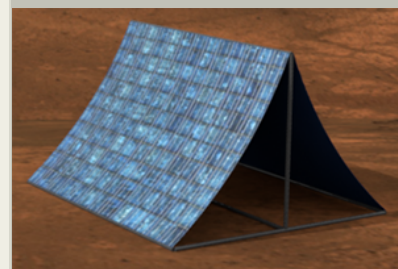
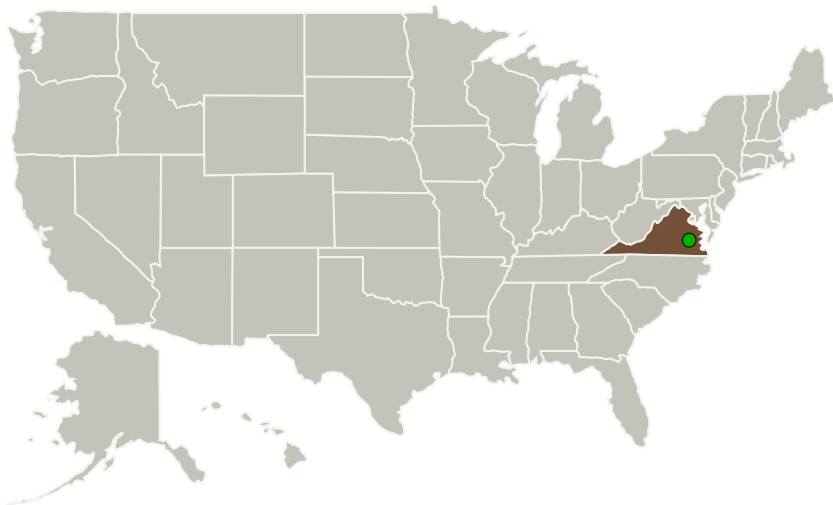
Completed Technology Project (2017 - 2017)



## Project Introduction

The Self-Deploying Tent Array (SDTA) is a modular power system that can be scaled to very large power levels for use on the Martian surface. The tent shape is structurally efficient and packages well with a flexible photovoltaic blanket. The tent array geometry produces a much more constant power output throughout a day than a non-tracking flat array, and provides significant power at sunrise and sunset. This results in efficiencies in the power processing and storage system, to which the array would be integrated, that reduce the total system mass significantly. The tent shape is also inherently resistant to dust buildup due to the slope of the arrays, and is amenable to a number of wind loading mitigations that will be examined in Phase I work. The module self-deploys and can naturally straddle large boulders. It can clear 0.5 m obstacles on the ground via two deployment schemes that will be examined. Phase I work will consist of conceptual design of the module, structural analysis & optimization, performance analysis, module sizing within a large array system, and mechanical design of a module. This will prepare for detail design, manufacture and deployment testing in Phase II.

## Primary U.S. Work Locations and Key Partners



Self-Deploying Tent Array,  
Phase I Briefing Chart Image

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

## Self-Deploying Tent Array, Phase I

Completed Technology Project (2017 - 2017)

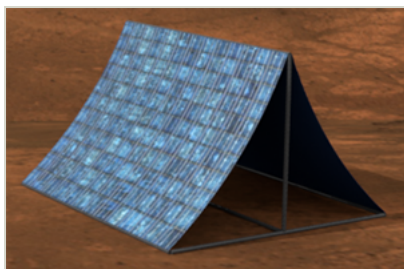


Organizations Performing Work	Role	Type	Location
Analytical Mechanics Associates, Inc.	Lead Organization	Industry	Hampton, Virginia
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

## Primary U.S. Work Locations

Virginia

## Images



## Briefing Chart Image

Self-Deploying Tent Array, Phase I  
Briefing Chart Image  
(<https://techport.nasa.gov/image/130107>)

## Organizational Responsibility

## Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

## Lead Organization:

Analytical Mechanics Associates, Inc.

## Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

## Program Director:

Jason L Kessler

## Program Manager:

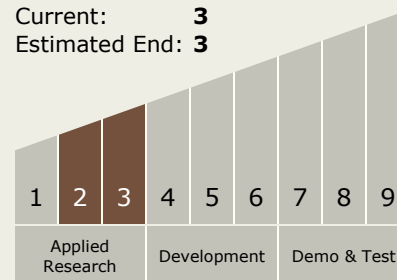
Carlos Torrez

## Principal Investigator:

Matthew Duchek

## Technology Maturity (TRL)

Start: 2  
Current: 3  
Estimated End: 3



## Self-Deploying Tent Array, Phase I

Completed Technology Project (2017 - 2017)



### Technology Areas

#### Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - └ TX12.2 Structures
    - └ TX12.2.1 Lightweight Concepts

### Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System